



**PWRS-0026**  
**BCKP-0029**

## **6U CompactPCI Power Supply with UPS**



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## Document Revisions

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Rev	Comment	BY	Date
E0	Release - Preliminary	DG	11/25/00
E0.1	Additions and corrections	DG	12/07/00
E1.0	Release, Windows utility added, UPS time defaults changed	DG	04/16/01
E2.0	Update document format	TJ	01/10/02

# Table of Contents

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<b><i>I. Ordering Information .....</i></b>	<b><i>4</i></b>
<b><i>II. System Configuration .....</i></b>	<b><i>5</i></b>
<b><i>III. Specifications .....</i></b>	<b><i>7</i></b>
<b><i>A. Physical Specifications .....</i></b>	<b><i>7</i></b>
<b><i>B. Environmental Specifications .....</i></b>	<b><i>8</i></b>
<b><i>C. Front Panel Indicators .....</i></b>	<b><i>8</i></b>
<b><i>D. Power Specification.....</i></b>	<b><i>8</i></b>
<b><i>E. On Board Fuses .....</i></b>	<b><i>9</i></b>
<b><i>IV. Power Supply Card.....</i></b>	<b><i>10</i></b>
<b><i>A. Power Supply Block Diagram .....</i></b>	<b><i>10</i></b>
<b><i>B. UPS Option.....</i></b>	<b><i>11</i></b>
<b><i>C. Functionality .....</i></b>	<b><i>11</i></b>
<b><i>V. Logic Board .....</i></b>	<b><i>12</i></b>
<b><i>A. LOGIC Board Block Diagram .....</i></b>	<b><i>13</i></b>
<b><i>VI. BACKUP Board .....</i></b>	<b><i>14</i></b>
<b><i>A. Battery Backup Block Diagram.....</i></b>	<b><i>15</i></b>
<b><i>VII. PCI Driver Operation .....</i></b>	<b><i>16</i></b>
<b><i>VIII. Handshake Mode Operation .....</i></b>	<b><i>17</i></b>
<b><i>IX. Memory Map.....</i></b>	<b><i>18</i></b>
<b><i>X. Warranty.....</i></b>	<b><i>19</i></b>

## I. Ordering Information

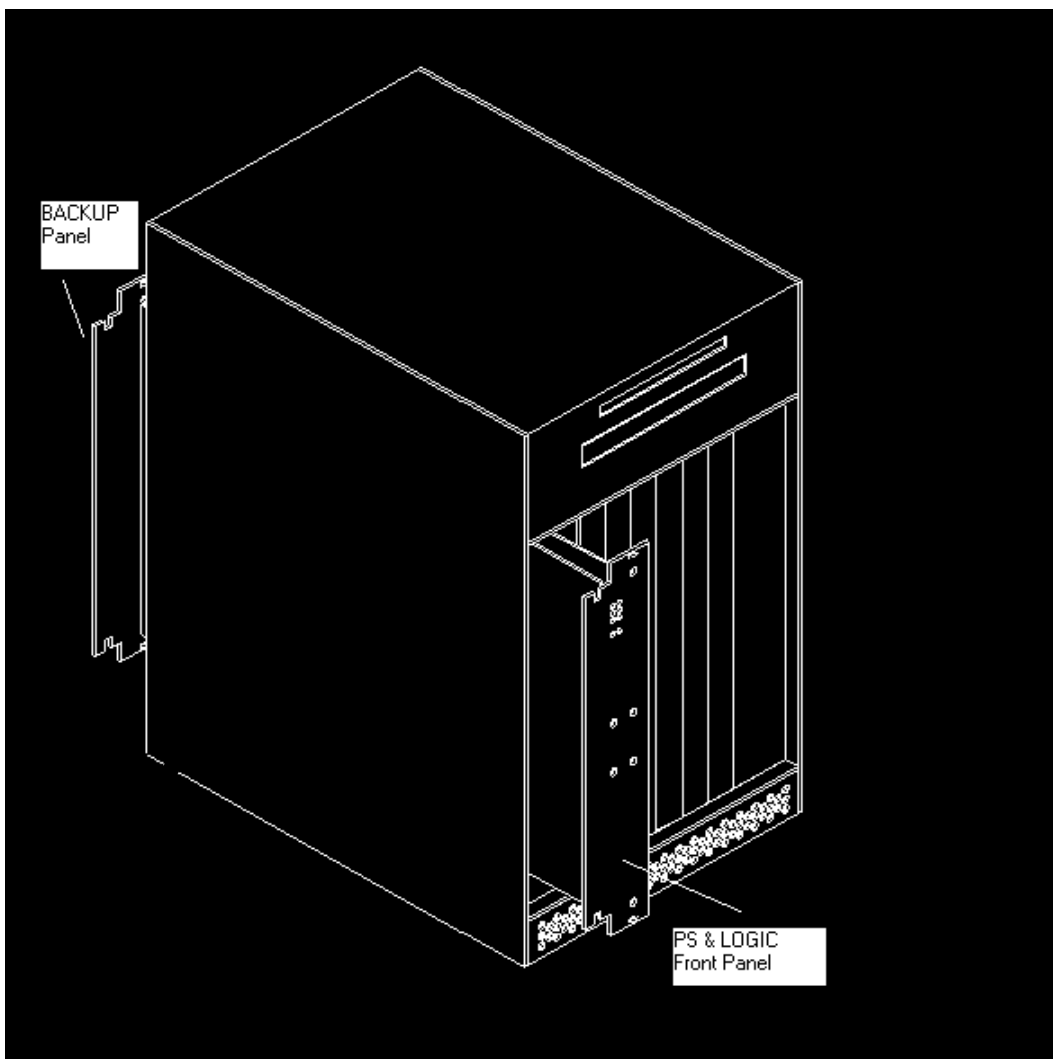
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<b>Part Number</b>	<b>Description</b>
AS00026-01	Power supply card, 130 watts, 6U, M type connector
AS00030-01	UPS logic board, 6U
AS00043-01	Power supply with UPS logic board
AS00029-01	Battery back up module, 6U

## II. System Configuration

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This document describes the specifications and functionality of Tenta's 6U CompactPCI Power Distribution board with UPS. The power supply board provides power signals through M-type connector to the CompactPCI back plane. It may be used stand alone, or with the optional UPS logic and battery backup module. The power supply board form factor, physical dimension and BUS interface comply with CompactPCI Specification PICMG 2.0 R2.1.



The full system consists of three main components. The power supply can be used stand alone, or combined with items #2 - #3 for a full UPS system.

- 1) **PS**            Power conversion :  
                     AC/DC: 90-132 / 180-264 VAC -> 15V  
                     DC/DC: conversion of 15V to 5V,3.3V,±12V
- 2) **LOGIC**        Charger for Ni-Cd battery  
                     PCI Interface  
                     Serial Logic
- 3) **BACKUP**      Ni-Cd battery pack  
                     Serial Interface

### III. Specifications

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#### A. Physical Specifications

<b>Criteria</b>	<b>Specifications</b>
<b>PS and LOGIC</b>	
PCB Dimensions	233MM (9.1875") Height X 160MM (6.2992") Depth X 1.6MM (0.0629") Thickness
Form Factor	Plug in Euro card, 6U Height, IEEE (1101.1, 101.10 and P1101.11)
Connectors	M-Type Connector on power board; metric 2.0mm grid female connector for J1 (cPCI BUS) and J5 (signal distribution) on logic board
Front Panel	262mm Height X 50mm Width x 2mm Thickness, with power and status indication LED's
Weight	900g
<b>BACKUP</b>	
PCB Dimensions	233MM (9.1875") Height X 80MM (3.1496") Depth X 1.6MM (0.0629") Thickness
Form Factor	Plug in Euro card, 6U Height, IEEE (1101.1, 101.10 and P1101.11)
Connectors	Metric 2.0mm grid female connector for J5 (signal distribution)
Front Panel	262mm Height X 50mm Width x 2mm Thickness with dsub9 female (handshake signal connector)
Weight	800g

## B. Environmental Specifications

Criteria	Specifications
Operating temperature	0-70 °C
Storage	-40 to +85 °C
Humidity	5 to 95% non-condensing

## C. Front Panel Indicators

Label	Function
+12V	+12 VDC supply, green
-12V	-12 VDC supply, green
+15V	+15 VDC supply, green
+5V	+5 VDC supply, green
+3.3V	+3.3 VDC supply, green
NT SHT DWN	NT in shutdown state, green, blinking
PWR FAIL	Loss of AC power, red
CHRG/COMP	Battery charging, orange; Battery fully charged, green

## D. Power Specification

Criteria	Voltage	Power
AC - DC	90-132 / 180-264 -> 15V	~130W
DC - DC	15V -> 3.3V	~30W
	15V -> 5V	~75W
	15V -> ±12V	~25W



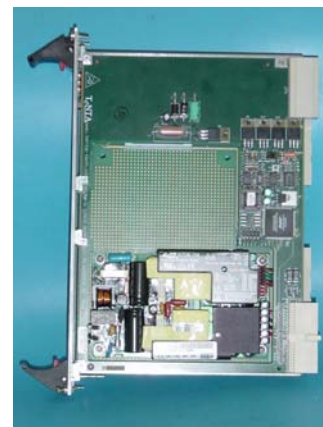
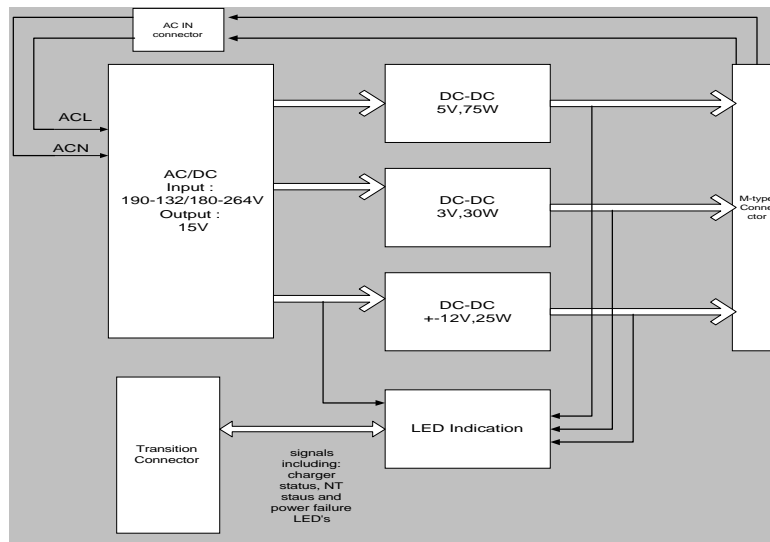
## E. On Board Fuses

<b>Fuse</b>	<b>Voltage</b>	<b>Value</b>
F1	+12V	3A
F2	-12V	0.375A
F3	+3.3V	5A
F4	+5V	10A
F5	+5V	10A

## IV. Power Supply Card

PS PCBA is responsible for converting AC input line to all required DC voltages needed in a cPCI system. It uses an AC/DC of 130W for the first phase and is designed for future upgrade to 180W with no additional PCB modifications. Three DC/DC converters provide conversion of the 15V (AC/DC output) to all required DC levels; one for 5V, one for 3.3V and one for  $\pm 12V$ .

### A. Power Supply Block Diagram



P/S board shown with Logic board

## B. UPS Option

The UPS option provides battery backup, up to 5 minutes, in order to allow the operating system to safely shut down upon a power failure. This system consists of two major components:

**LOGIC** is a mezzanine board to the PS card. It contains cPCI backplane connections through J1 and J5. J1 is used for PCI interface to the HOST, and J5 is used for power signal transition between the battery and the charger, and also used to route the control signal for power sequence between HOST and UPS control when in serial handshake mode.

**BACKUP** is a cPCI card which is inserted from the back side of the cage behind the second slot and contains the battery and serial port handshake connector.

## C. Functionality

The UPS provides backup power during a power loss. The logic is dependent upon the driver installed. A driver for serial handshake and for a full PCI mode is available. In either case, a charge circuit continually monitors the battery and provides charging when needed. The charge point has built in hysteresis. During a standard operating system shutdown, the UPS is not activated. During power loss, a shutdown under battery power is completed.

## V.Logic Board

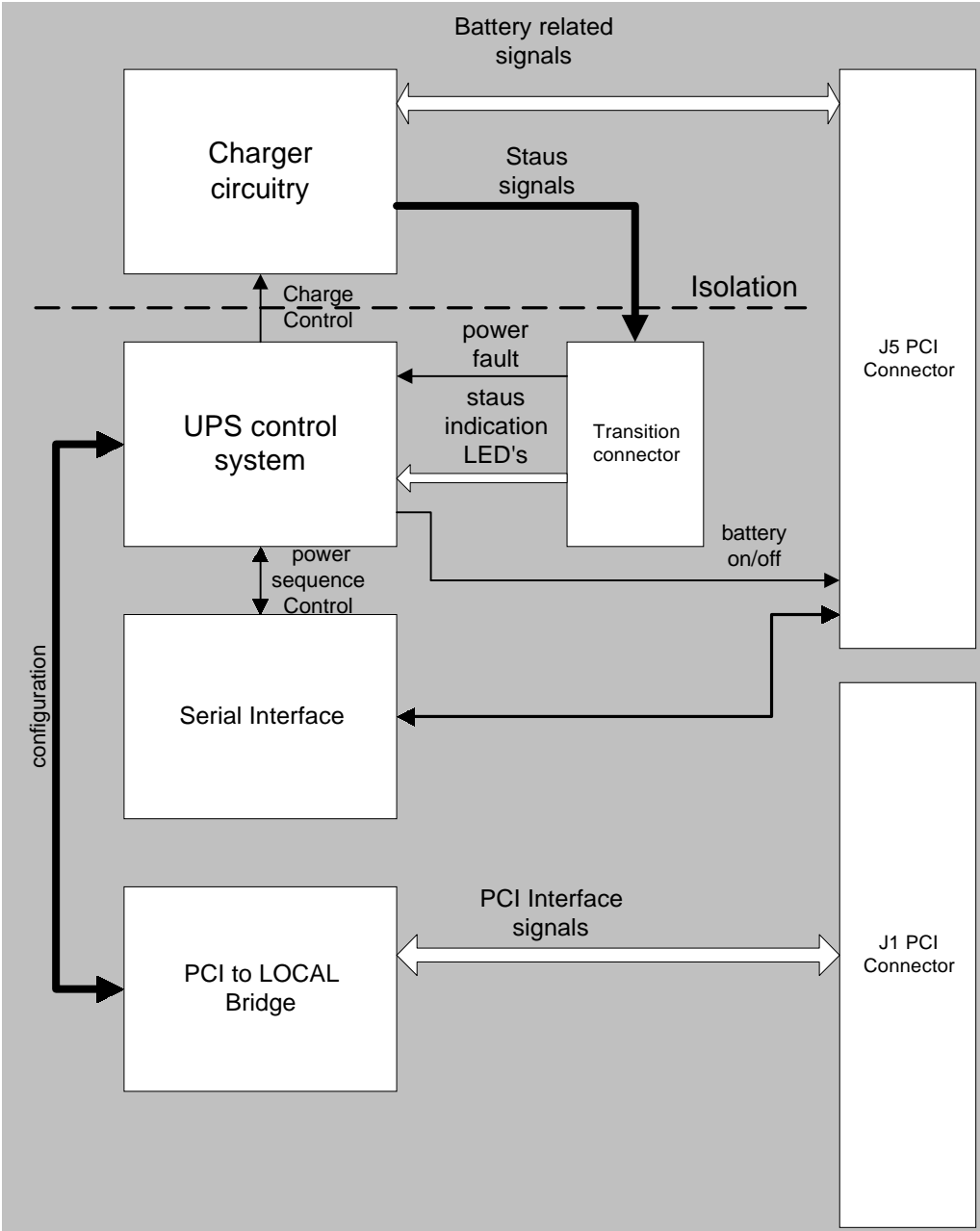
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LOGIC board is responsible for :

- 1) PCI interface with the HOST, achieved by using a smart PCI to LOCAL bridge
- 2) UPS control – including charger circuitry, power failure detection and handshake with NT via serial bus or CPCI bus for power shut down sequence.
- 3) Routing power signals from the BACKUP board to PS during power failure.

The power failure detection circuit is responsible for identifying a power failure and switching the Backup. During a short power loss, the logic (with selectable FAIL\_TIME), may rely on internal capacitance to ensure continuous operation rather than aborting to a shutdown mode.

# A. LOGIC Board Block Diagram

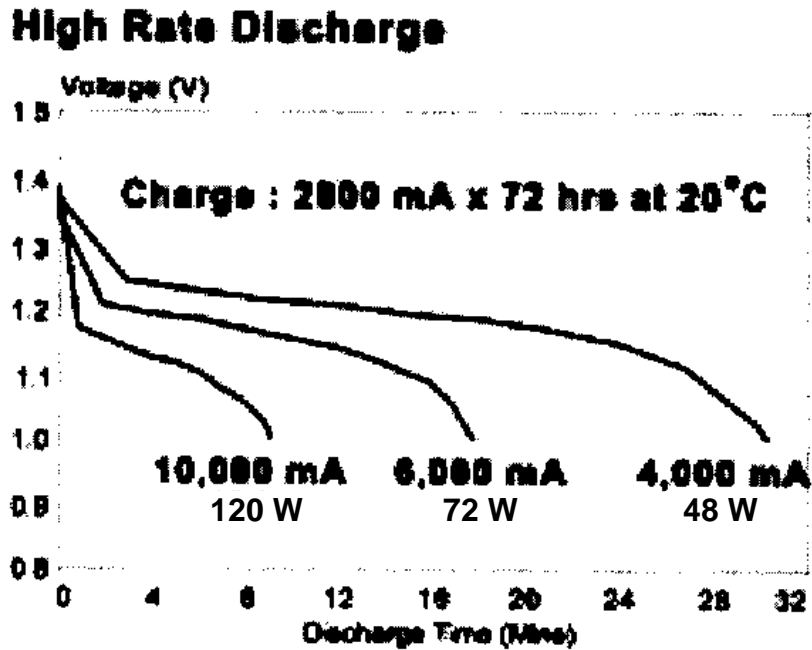


## VI. BACKUP Board

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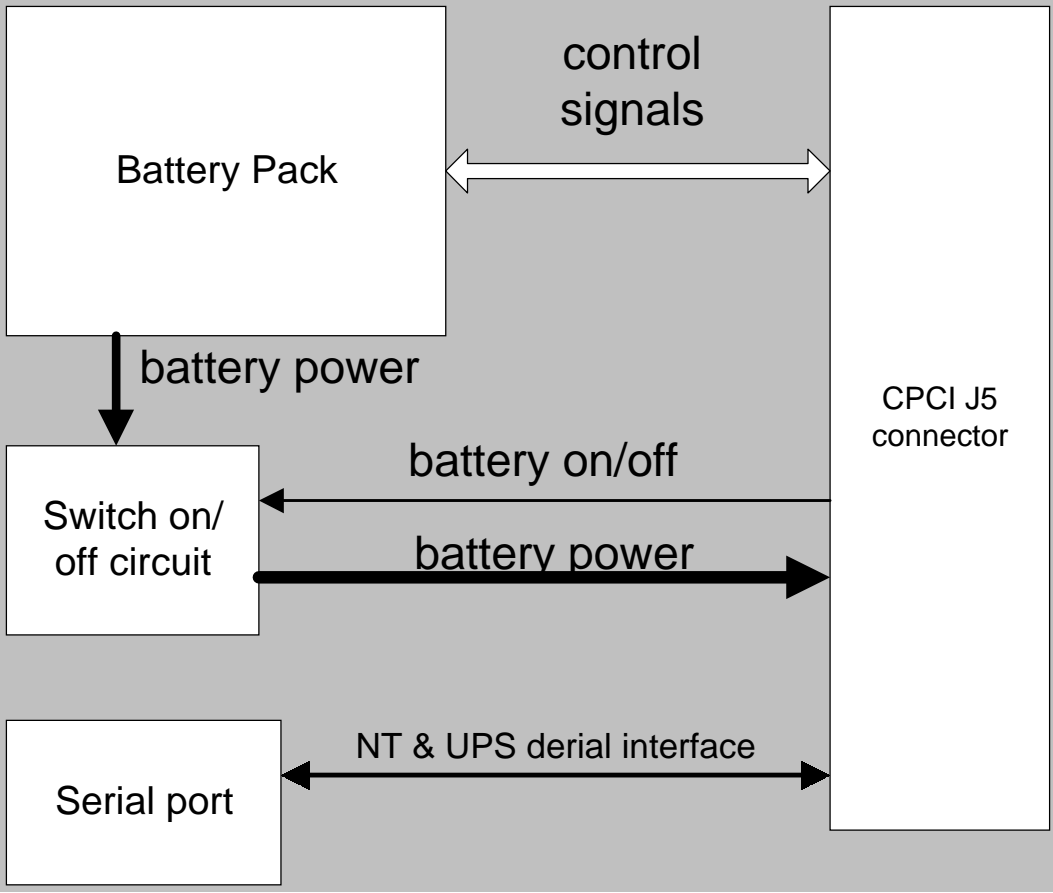
BACKUP holds the battery pack on rear side of the cage, and provides power to the LOGIC board through J5 (CPCI standard connector). A D-sub 9 connector also provides handshake logic signals with a selected COM port.

The battery pack is capable of powering a 130 watt system for a minimum of 5 minutes. The 12 VDC battery pack consists of (10) 1.2 VDC cells in series, and can supply 10.8 amps for more than 5 minutes as shown in the graph below:



Charging time of fully discharged battery pack lasts 5 hours maximum. Typical charging time is 3.6 hours. Battery is rated for 500 full discharge to charge cycles.

### A. Battery Backup Block Diagram



### Serial Handshake Signal Connector

Ref	Signal name	BACKUP Signal	COM x Signal
1	NT_CLSD	4	4
2	NT_SHTDWN_BUF	8	8

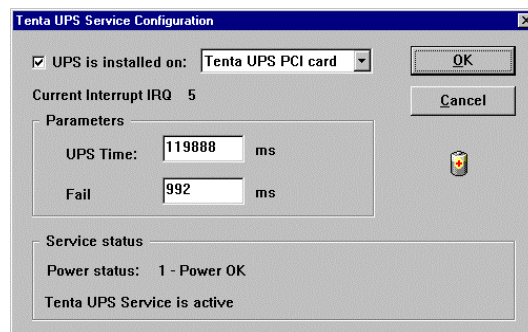
## VII. PCI Driver Operation

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A Windows NT driver is provided to manage all UPS functions. After installation, the driver will run as a background service, and provides access to all set up parameters through the Control Panel icon. Select and fill in any parameters which need to be modified from default. All communication between the processor and UPS is through the PCI bus.

Default for UPS Time is 120,000 ms.

Default for Fail Time is 1,000 ms.



### Logic:

On power up, the UPS driver task starts automatically. Assuming that the UPS driver is installed and activated through the Control Panel utility, the UPS is enabled and begins charging. CHRG/COMP will be orange. Upon being fully charged, CHRG/COMP will turn green.

The system continuously checks for a power failure, indicated by the PWR FAIL LED. A voltage loss for less than Fail Time will have no effect on the system. A voltage loss for Fail Time or greater will result in System Shutdown with battery backup assistance.

All programs will be shut down, and the Registry will be saved. The UPS will monitor this activity, and upon completion will turn off the System.

If for any reason this does not happen (ie. operating system locks up), the UPS will turn off the System after a time period of UPS\_TIME.

Upon a User selected Shutdown of NT, all battery backup functionality is disabled.



## VIII. Handshake Mode Operation

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The following describes the internal logic and variables used in Handshake Mode. The standard NT UPS functionality is used in addition to the following logic. A driver and DOS utility are provided with this functionality.

On power up, UPS\_ENABLE = 0

After NT completes boot, set UPS\_ENABLE = 1

POWER\_OK = 1 until power detection circuit determines power loss, then  
POWER\_OK = 0

FAIL\_MODE = 1 if POWER\_OK = 0 for more than FAIL\_TIME

If FAIL\_MODE and UPS\_ENABLE = 1, provide UPS battery power until  
time > UPS\_TIME or REMOTE\_UPS\_SHUTDOWN is received.

On standard NT shut-down, UPS functionality is disabled.

### Definition of terms:

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UPS_ENABLE	Internal register which controls enable state of UPS
POWER_OK	Internal register which indicates status of incoming power line
FAIL_TIME	Time that a no power condition is detected until FAIL_MODE = 1
UPS_TIME	Time that power is supplied after FAIL_MODE = 1
REMOTE_UPS_SHUTDOWN	COM port handshake signal from CPU to shut down supply. Default time delay is 2 minutes.

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## IX. Memory Map

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Name	<b>UPS_ENABLE</b>
Description	Enable battery to supply power to the BUS in "fail mode"
Offset	0x0
Size	32bit
Values	1 Enable 0 Disable
Default	Disable
Updated by	NT program

Name	<b>UPS_TIME</b>
Description	Time to supply power for shutdown
Offset	0x4
Size	32bit
Values	10000ms to 300000ms
Scale Factor	127ms
Default	120000ms
Updated by	NT program

Name	<b>FAIL_TIME</b>
Description	Acceptable duration of power loss before triggering a shutdown
Offset	0x8
Size	32bit
Values	50ms to 2000ms
Scale Factor	16 ms
Default	1000 ms
Updated by	NT program

Name	<b>POWER_OK</b>
Description	Power status
Offset	0xC
Size	32bit
Values	0 no power 1 power OK
Default	1
Updated by	Power supply board

## **X. Warranty**

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Tenta Technology warrants the original purchaser for two years from the date of delivery for any defect in the product, material or workmanship. Product should be used in suitable installation environment and for the purposes it was designed. Any damages caused by natural disasters such as: fire, flood, wind and lightning are not covered. For more information, please contact Tenta Technology customer support (see locations on front page). Tenta Technology hardware and software are not intended for use in any manner when human life or safety is at risk and not for use in life support equipment.